Abies fraseri / (Rhododendron catawbiense, Rhododendron carolinianum) Forest

COMMON NAME	Fraser Fir / (Catawba Rhododendron, Mountain Carolina Rhododendron) Forest
SYNONYM	Fraser Fir Forest (Evergreen Shrub Type)
PHYSIOGNOMIC CLASS	Forest (I)
PHYSIOGNOMIC SUBCLASS	Evergreen forest (I.A)
PHYSIOGNOMIC GROUP	Temperate or subpolar needle-leaved evergreen forest (I.A.8)
PHYSIOGNOMIC SUBGROUP	Natural/Semi-natural (I.A.8.N)
FORMATION	Conical-crowned temperate or subpolar needle-leaved evergreen forest (I.A.8.N.c.)

ALLIANCE *Abies fraseri - Picea rubens* Forest Alliance

CLASSIFICATION CONFIDENCE LEVEL 1

USFWS WETLAND SYSTEM Upland

RANGE

Globally

This community occurs as island-like stands in the southern Appalachian Mountains of eastern Tennessee and western North Carolina. It is extremely limited in distribution and is restricted to the following mountain areas: Great Smoky Mountains, Black Mountains, Balsam Mountains, Plott Balsams, and Grandfather Mountain.

Great Smoky Mountains National Park

This community was not sampled or observed on the two pilot quadrangles, but it is likely within the Park boundary. It should be looked for at elevations above 6000 feet (1830 meters) on exposed sites (rocky ridges and steep, south-facing slopes).

ENVIRONMENTAL DESCRIPTION

Globally

These forests occur on rocky spurs, steep ridges, and south-facing slopes above 6000 feet (1830 m) elevation, often adjacent to montane shrublands. These forests occur on all topographic positions except the steepest rocky cliffs of the highest summits. Soils that support this community are classified as Inceptisols and are shallow, rocky, and often have a thick organic layer. Moisture regimes are mesic to wet, due to high rainfall, abundant cloud cover, fog deposition, and low temperatures. This forest may grade into forests dominated by *Picea rubens* and *Abies fraseri*, montane grasslands, high elevation shrublands, or high elevation rock outcrop communities.

Great Smoky Mountains National Park

No information

MOST ABUNDANT SPECIES

Globally

Stratum	Species
Tree canopy	*Abies fraseri*
Tall Shrub	*Rhododendron catawbiense, Rhododendron carolinianum*, *Rhododendron maximum*

Great Smoky Mountains National Park

Stratum	Species
No information	

CHARACTERISTIC SPECIES

Globally

Abies fraseri, Rhododendron catawbiense, Rhododendron carolinianum, Rhododendron maximum

Great Smoky Mountains National Park

No information

VEGETATION DESCRIPTION

Globally

This needle-leaved evergreen forest has greater than 75 percent canopy coverage by *Abies fraseri*. *Abies fraseri* in the canopy are 17-23 cm in diameter and 10-11 m tall, giving these forests a stunted appearance. Other species that may occur with low coverage in the canopy or subcanopy are *Picea rubens*, *Sorbus americana*, *Betula alleghaniensis*, *Prunus pensylvanica*. The tall-

shrub stratum is dominated by evergreen species and, although there may be considerable variation, is usually quite dense. Typical shrub dominants include *Rhododendron catawbiense, Rhododendron carolinianum*, and *Rhododendron maximum*. Herbaceous cover is typically sparse. On steep, rocky, northerly slopes, coverage by mosses, liverworts, and lichens can approach 100 percent. Bryophyte species include *Hylocomium splendens*, *Ptilium crista-castrensis*, *Sphagnum* spp.*,* and *Polytrichum ohioense*.

Great Smoky Mountains National Park
No information

OTHER NOTEWORTHY SPECIES
Rare or regionally rare vascular plant species associated with this community include *Abies fraseri*, *Betula papyrifera* var. *cordifolia*, *Cardamine clematitis*, *Glyceria nubigena*, *Phegopteris connectilis*, *Poa palustris*, *Rhododendron vaseyi*, *Stachys clingmanii*, *Streptopus amplexifolius*. Rare non-vascular plants include *Bazzania nudicaulis*, *Brachydontium trichodes*, *Leptodontium excelsum*, *Metzgeria temperata*, *Nardia scalaris*, *Plagiochila corniculata*, and *Sphenolobopsis pearsonii*.

Animals endemic to high elevation areas of the southern Appalachians include Carolina Flying Squirrel *(Glaucomys sabrinus coloratus*), Yonahlossee Salamander *Plethodon yonahlossee*, Weller's Salamander (*Plethodon welleri*), Spruce-fir Moss Spider *Microhexura montivaga*. Rare animal species that are northern disjuncts include Black-capped Chickadee (*Parus atricapillus*, and Northern Saw-whet Owl (*Aegolius acadicus*). The spruce-fir moss spider (*Microhexura montivaga* G1) is specific to this community type. The spider populations seem to be decreasing with the decline of these forests. As the canopy thins, moss desiccation increases, thus affecting the spider's habitat.

An exotic insect, the Balsam Woolly Adelgid (*Adelges piceae*), invaded the southern Appalachians in the late 1950s and has drastically altered the last undisturbed remnants of this community. This exotic pest kills mature *Abies fraseri* within seven years of infestation.

CONSERVATION RANK G1

RANK JUSTIFICATION
This community has a naturally restricted distribution, occurring only on the highest elevation peaks of the southern Appalachian Mountains. It exists in only a small portion of its original range due to the impact of early 20th century, post-logging fires and the ongoing outbreak of the Balsam Woolly Adelgid, an exotic pest that infests and kills mature *Abies fraseri*. Well-developed, undisturbed examples of this community are extremely rare. Most remaining examples of this community exist as patches of dense young trees or dense *Rubus* thickets beneath forests of dead snags or tangles of fallen logs.

DATABASE CODE CEGL006308

COMMENTS
Globally
This community may grade into forests dominated by *Picea rubens* and *Abies fraseri*, montane grasslands, high elevation shrublands, or high elevation rock outcrop communities.

Great Smoky Mountains National Park

REFERENCES
Brown 1941, Bruck 1988, Busing et al. 1988, Crandall 1958, Davis 1930, McLeod 1988, Nicholas et al. 1992, North Carolina Natural Heritage Program 1993, Oosting and Billings 1951, Ramseur 1960, Schafale and Weakley 1990, White 1984, White and Pickett 1985, White et al. 1993, Whittaker 1956